REMARKS

In the Final Office Action mailed January 9, 2003, 1-5 and 16 were rejected under 35 USC 103(a) as being unpatentable over Ishikawa et al. (U.S. Patent No. 5,917,637) in view of Utsumi (U.S. Patent No. 6,031,644); claims 7 and 10-15 were rejected under 35 USC 103(a) as being unpatentable over Ishikawa in view of Utsumi and further in view of Aoki (U.S. Patent No. 5,315,426); and claims 8 and 9 were rejected under 35 USC 103(a) as being unpatentable over Ishikawa and Utsumi in view of Aoki and further in view of Brenner et al. (U.S. Patent No. 6,115,403). The foregoing rejections are respectfully traversed.

In accordance with the foregoing, claims 1, 7, and 16 have been amended. Claims 1-5 and 7-16 are pending and under consideration.

Claims 1, 7, and 16 are independent claims. Claims 2-5 depend, either directly or indirectly, from claim 1, and claims 8-15 depend, either directly or indirectly, from claim 7.

Ishikawa et al. discloses a method of and device for driving an optical modulator, and an optical communication system. More particularly, Ishikawa discloses a device and method for driving an electro-absorption optical modulator for receiving a carrier light source and outputting signal light subjected to intensity modulation according to the absorption of the carrier light. The Ishikawa device includes a bias circuit, a driving circuit, and a control circuit.

Utsumi discloses a method, device, and system for controlling the wavelength of an optical signal. More particularly, Utsumi discloses varying wavelengths and comparing error counts detected at those varied wavelengths with an error count detected at an initial wavelength.

Aoki discloses an optical transmitter in which stimulated Brillouin scattering does not occur even if a laser light having a high power is coupled in an optical fiber. As shown in Figures 1 and 2 of Aoki, the Aoki apparatus includes an optical transmitter, an optical fiber, and an optical receiver.

Brenner et al. discloses a directly modulated semiconductor laser having reduced chirp, in which an in- line fiber Bragg grating is coupled to the output of a directly-modulated DFB laser.

Ishikawa in view of Utsumi discloses a method of and device for driving an optical

modulator, and an optical communication system, including a method, device, and system for controlling the wavelength of an optical signal.

Ishikawa in view of Utsumi and Aoki discloses a device and method for driving an electro-absorption optical modulator for receiving a carrier light source and outputting signal light subjected to intensity modulation according to the absorption of the carrier light, including a method, device, and system for controlling the wavelength of an optical signal and an optical transmitter, an optical fiber, and an optical receiver.

Ishikawa in view of Utsumi and Aoki, and further in view of Brenner, discloses a device and method for driving an electro-absorption optical modulator for receiving a carrier light source and outputting signal light subjected to intensity modulation according to the absorption of the carrier light, including a method, device, and system for controlling the wavelength of an optical signal and an optical transmitter, an optical fiber, and an optical receiver, in which a directly modulated semiconductor laser having reduced chirp, in which an in- line fiber Bragg grating is coupled to the output of a directly-modulated DFB laser.

Each of independent claims 1, 7, and 16 (as amended) recites (using the recitation of claim 1 as an example) "controlling said chirp parameter based upon comparing between a first number of corrections of said bit error detected when the chirp parameter is set to a positive value and a second number of corrections of said bit error detected when the chirp parameter is set to a negative value".

None of the foregoing references relied upon, either alone or in combination, discloses or suggests the foregoing features of the present invention.

The above-mentioned dependent claims recite patentably distinguishing features of their own. For example, claim 2/1 recites "said controlling including switching the sign of said chirp parameter".

Withdrawal of the foregoing rejections is respectfully requested.

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: May 8, 2003

By:
Gene M. Garner II
Registration No. 34,172

700 Eleventh Street, NW, Suite 500
Washington, D.C. 20001
(202) 434-1500

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please AMEND the following claims:

1. (THREE TIMES AMENDED) A method comprising:

outputting an optical signal having a chirping determined by a chirp parameter to an optical fiber transmission line, including generating said optical signal by optical modulation based on a modulating signal obtained by adding a redundancy code to a transmission data code;

converting the optical signal transmitted by said optical fiber transmission line into an electrical signal;

detecting a bit error of said electrical signal;

controlling said chirp parameter so that said bit error detected is reduced; and

correcting said bit error of said electrical signal according to said redundancy code, wherein said detecting including counting the number of corrections of said bit error obtained in said correcting, and wherein said controlling said chirp parameter based upon comparing between a first number of corrections of said bit error detected when the chirp parameter is set to a positive value and a second number of corrections of said bit error detected when the chirp parameter is set to a negative value.

2. (AS ONCE AMENDED) A method according to claim 1, wherein said controlling including switching the sign of said chirp parameter.

3. (AS ONCE AMENDED) A method according to claim 2, wherein:

said outputting including generating said optical signal by optical modulation using a Mach-Zehnder optical modulator; and

controlling including switching an operating point of said Mach-Zehnder optical modulator.

4. (AS ONCE AMENDED) A method according to claim 1, said outputting including adjusting said chirp parameter to an optimum value so that said bit error detected is minimized.

5. (AS ONCE AMENDED) A method according to claim 4, wherein:

outputting including generating said optical signal by optical modulation using an electroabsorption optical modulator; and

controlling including changing a bias voltage to be applied to said electroabsorption optical modulator.

7. (THREE TIMES AMENDED) A system comprising:

first and second terminal devices; and

an optical fiber transmission line connecting said first and second terminal devices;

said first terminal device comprising:

an optical transmitter outputting an optical signal having a chirping determined by a chirp parameter to said optical fiber transmission line, said optical transmitter generating said optical signal by optical modulation based on a modulating signal obtained by adding a redundancy code to a transmission data, and

a control unit controlling said chirp parameter according to a control signal, said control unit correcting said bit error of said electrical signal according to said redundancy code;

said second terminal device comprising:

an optical receiver converting the optical signal transmitted by said optical fiber transmission line into an electrical signal,

a monitor unit detecting a bit error of said electrical signal, said monitor unit comprising counting the number of corrections of said bit error obtained by said control unit, and

means for transmitting supervisory information on said bit error detected to said first terminal device; wherein said control signal is generated in said first terminal device so that said bit error detected is reduced and wherein said control unit controlling said chirp parameter based upon comparing between a first number of corrections of said bit error <u>detected when the chirp parameter is set to a positive value</u> and a second number of corrections of said bit error <u>detected when the chirp parameter is set to a negative value</u>.

8. (AS ONCE AMENDED) A system according to claim 7, wherein:

said optical transmitter comprises a light source outputting continuous wave (CW) light, and a Mach-Zehnder optical modulator for modulating said CW light to generate said optical signal; and

said control unit includes means for switching an operating point of said Mach-Zehnder optical modulator, thereby switching the sign of said chirp parameter.

9. (AS ONCE AMENDED) A system according to claim 7, wherein:

said optical transmitter comprises a light source for outputting continuous wave (CW) light, and an electroabsorption optical modulator for modulating said CW light to generate said optical signal; and

said control unit includes means for changing a bias voltage to be applied to said electroabsorption optical modulator, thereby adjusting said chirp parameter to an optimum value so that said bit error detected is minimized.

10. (AS ONCE AMENDED) A system according to claim 7, wherein:

said optical transmitter comprises a light source outputting continuous wave (CW) light, an encoder adding the redundancy code to the transmission data code to thereby generate the modulating signal, an optical modulator modulating said CW light according to said modulating signal to thereby generate said optical signal;

said optical receiver includes a decoder correcting said bit error of said electrical signal according to said redundancy code; and

said monitor unit includes means for counting the number of corrections of said bit error obtained by said decoder.

11. (AS ONCE AMENDED) A system according to claim 7, wherein:

said first terminal device further comprises an optical amplifier amplifying the optical signal output from said optical transmitter.

12. (AS ONCE AMENDED) A system according to claim 7, wherein:

said second terminal device further comprises an optical amplifier amplifying the optical signal to be received by said optical receiver.

13. (AS ORIGINAL) A system according to claim 7, wherein said optical fiber transmission line is provided by a dispersion shifted fiber having a zero-dispersion wavelength near 1.55μm.

14. (AS ORIGINAL) A system according to claim 7, wherein said optical fiber transmission line is provided by a single-mode fiber having a zero-dispersion wavelength near 1.3μm.

15. (AS ONCE AMENDED) A system according to claim 14, wherein said first terminal device further comprises a dispersion compensating fiber compensating for chromatic dispersion occurring in said optical fiber transmission line, and an optical amplifier amplifying the optical signal output from said optical transmitter.

16. (THREE TIMES AMENDED) A terminal device comprising:

an optical transmitter outputting an optical signal having a chirping determined by a chirp parameter to an optical fiber transmission line, said optical signal generated by optical modulation based on a modulating signal obtained by adding a redundancy code to a transmission data code;

means for receiving supervisory information on a bit error detected in relation to the optical signal transmitted by said optical fiber transmission line; and

means for controlling said chirp parameter according to said supervisory information so that said bit error detected is reduced, wherein said supervisory information including the number of corrections of said bit error obtained in correcting said bit error of said electrical signal according to said redundancy code and wherein said means for controlling said chirp parameter based upon comparing between a first number of corrections of said bit error detected when the chirp parameter is set to a positive value and a second number of corrections of said bit error detected when the chirp parameter is set to a negative value.